
Two New Species of *Faramea* (Rubiaceae, Coussareeae) from Eastern Brazil

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ABSTRACT. As part of the first author's Ph.D. studies, two new species of *Faramea* Aublet, *F. atlantica* J. G. Jardim & Zappi and *F. bicolor* J. G. Jardim & Zappi, are described from the Atlantic Forest of eastern Brazil. Both species are illustrated, and comments on their phenology, distribution, and conservation status are provided.

RESUMO. Formando parte dos estudos de Doutorado do primeiro autor, duas novas espécies de *Faramea* Aublet, *F. atlantica* J. G. Jardim & Zappi e *F. bicolor* J. G. Jardim & Zappi, são descritas para a Mata Atlântica do leste do Brasil. Ambas são ilustradas, juntamente com comentários relativos à sua fenologia, distribuição e estado de conservação.

Key words: Atlantic Forest, Brazil, Coussareeae, *Faramea*, IUCN Red List, Rubiaceae.

According to Andersson (1992) and Govaerts et al. (2006), *Faramea* Aublet (Rubiaceae, tribe Coussareeae) comprises ca. 200 species distributed throughout the Neotropics from Mexico to northern Argentina. Govaerts et al. (2006) cite 123 species for Brazil, and, of those, 74 occur in the eastern part of the country, mostly in areas of coastal wet tropical or Atlantic rainforest.

The present new discoveries stem from the ongoing Ph.D. thesis by the first author, which is preceded by his M.Sc. thesis on Bahian *Faramea* (Jardim, 2003). Of the 16 species found in Bahia, two new endemic species were already treated (Jardim & Zappi, 2008). The two new species described here have a wider distribution in Brazil, and further work is necessary to define their circumscription. The conservation status was calculated from the guidelines provided by IUCN (2001).

1. *Faramea atlantica* J. G. Jardim & Zappi, sp. nov.

TYPE: Brazil. Bahia: Itacaré, Rod. BR 101–Itacaré, vicinal para fazendas, entrada ca. 1 km da BR101. Faz. Monte Alegre (Prop. Domingos Badaró), ca. 9 km da BR, 14°19'S, 39°15'W, 5

Feb. 2004 (fl), J. G. Jardim 4212 (holotype, CEPEC; isotype, HUEFS). Figure 1.

A *Faramea bracteata* Bentham foliis duplo minoribus atque petiolatis, bracteis pallide viridibus nec lavandulaceis differt; a *F. corymbosa* Aublet bracteis concavis semi-involucratis, stipulis paulo aristatis vel aristis usque 2 mm longis (nec 2–5 mm) ornatis, pedunculis 1- ad 3-radiatis (non 3- ad 5-radiatis), fructibus rugosis duplo majoribus distincta.

Treelets to trees, 5–12 m tall, glabrous; branches cylindrical, lateral branching \pm parallel. Stipules mostly deciduous from the third node, foliaceous, sheath fused at base, limb triangular to obtuse, colleters inserted internally at base of the sheath, terminal arista 0.5–2 mm, not decurrent; petiole 0.5–1 cm; lamina 6–9 \times 2.5–4 cm, chartaceous, obovate to oblanceolate, apex 4–9 mm, apiculate, base cuneate, margin flat; secondary and tertiary venation visible adaxially, prominent abaxially. Inflorescences a terminal, reduced, pseudo-umbellate, 1- to 3-branched dichasium, 1- to 3-radiate peduncles flattened and thickened, 1–1.5 cm, pale green; pedicel to 1 mm; bracts corolline, 1.5–2.5 \times 1.5–2 cm, cordiform, concave, enveloping the flowers only 1/3, pale green, bracteoles inconspicuous. Flowers presumably heterostylous, scented, anthesis nocturnal; calyx tube 1 mm, apex truncate to shortly toothed, colleters internally inserted at base; flowers with white, hippocrateriform corolla, 7–12 mm, lobes 5–8 mm, patent to slightly reflexed, carnose; stamens inserted in the upper 1/3 of the tube, filaments 0.5 mm, anthers 2.5–3 mm; style 3–4 mm, stigmas 1–2 mm, internally papillose, nectar disk cylindrical to annular. Fruits ca. 9 \times 10 mm, oblate, sessile, pale green, pericarp wrinkled, with a shortly toothed calyx tube or displaying only the scar and the nectar disk; pyrene ca. 8 \times 9 mm, oblate, wrinkled, pre-germination orifice ca. 2 \times 2.5 mm, almost rounded; seed ca. 7 \times 6 mm, oblate, surface slightly rugose.

Distribution and habitat. The new species is found in eastern Brazilian Atlantic Forest, in the



Figure 1. *Faramaea atlantica* J. G. Jardim & Zappi. —A. Habit. —B. Stipule. —C. Reduced dichasium. —D. Gynoeceum and nectar disk. —E. Open corolla showing stamens, one lobe removed. —F. Fruit. —G. Pyrene, ventral view. A–E, drawn from the holotype *Jardim 4212*; F–G, drawn from *Jardim 4157*.

states of Bahia, Espírito Santo, Minas Gerais, and Rio de Janeiro, as small trees in the understory or medium-sized trees under the canopy.

IUCN Red List category. By IUCN (2001) criteria, *Faramea atlantica* is Vulnerable (VU), B2a, b (i, iii, iv); area of occupancy ca. 1000 km², using a cell size of 200 km². This species appears to have a wide extent of occurrence and is locally common. However, despite an intensive search, it seems to be practically absent from the few forested areas remaining between the known populations. This is a case where the cell size used for determining its IUCN category (IUCN, 2001) is crucial in establishing the status of the species. If using the sliding scale principle (Justin Moat, pers. comm.), the cell size for the species would be approximately 7400 km²; this cell size, however, exceeds by far the potential vegetation (mostly coastal Atlantic forest) over which this species may occur. Three of its five populations are protected in Bahia (Reserva Biológica de Una, Faz. Piedade), Espírito Santo (Reserva Florestal da Companhia Vale do Rio Doce), and Rio de Janeiro (Reserva Biológica União). In Minas Gerais, however, it was found by Saint-Hilaire (ca. 1816–1821), at an unspecified location, and has not been collected there since.

Phenology. Flowering plants were observed in November and from January to February; fruiting plants were observed in July and December.

Etymology. The species epithet refers to the species' singular biome of the eastern Brazilian Atlantic Forest.

Vernacular name. Pau-cravo (from *D. A. Foli 170*).

Relationships. *Faramea atlantica* differs from other species of *Faramea* from eastern Brazil due to its concave, corolline, pale green bracts partially enveloping the flowers and by the 1- to 3-radiate, thickened peduncles that appear flattened in dry specimens. This new species belongs to the group of *F. corymbosa*, with species known from the Guianas and Peru, which also have radiate, thickened peduncles. However, in *F. corymbosa*, the peduncles are normally more than 3; the bracts are smaller, flat, and lanceolate; the stipule is long aristate (arista 2–5 cm); and the fruits are smaller and more numerous. From the same group, *F. bracteata*, from central Brazil and the Amazon, and *F. parvibractea* Steyermark, widely distributed from Venezuela to Ecuador (Taylor, 1999) and Costa Rica, are also somewhat similar, presenting corolline bracts enveloping the flowers. The first taxon has lilac bracts and subcordate, sessile leaves, twice as long as *F. atlantica*; the second one

has calyptrate stipules and inflorescences with 5- to 13-radiate peduncles.

Paratypes. BRAZIL. **Bahia:** Itacaré, Rod. BR 101–Itacaré, Faz. Monte Alegre (Prop. Domingos Badaró) ca. 9 km da BR, *J. G. Jardim 4127* (CEPEC, HUEFS, K), *J. G. Jardim 4157* (CEPEC, HUEFS); Una, Rod. São José–Una, Faz. Piedade, a 9 km do entroncamento com a BR-101, *E. B. Santos & M. C. Alves 202* (CEPEC). **Espírito Santo:** Linhares, Reserva Florestal da CVRD, *D. A. Foli 170* (CVRD, NY not seen, RB, UB); Res. Flor. da CVRD, estrada da casa do guarda, *A. L. Peixoto 1062* (CVRD, RB). **Minas Gerais:** s. loc., 1816–1821, *Saint-Hilaire s.n.* (P). **Rio de Janeiro:** Rio das Ostras, Res. Biol. União, *P. P. Oliveira 625* (BHCB not seen, HUEFS).

2. *Faramea bicolor* J. G. Jardim & Zappi, sp. nov.
TYPE: Brazil. Bahia: Uruçuca, Rod. Serra Grande–Uruçuca ca. 14 km W, Parque Est. Serra do Conduru, 14°28.83'S, 39°06.33'W, Serra do Conduru, 18 Dec. 2003, *J. G. Jardim, A. M. Amorim, A. M. Z. Martini, S. C. de Sant'Ana & J. L. da Paixão 4169* (holotype, CEPEC; isotypes, HUEFS, K, MO, NY, RB, SPF). Figure 2.

Ab omnibus ceteris *Farameae* Aublet speciebus vaginis limbi stipularis connatis atque limbo ramos involvente, stipulis breviter vel haud aristatis, foliis coriaceis, ad marginem valde revolutis, corollis bicoloribus tubo albo atque lobis caeruleis distincta.

Treelets, 3–6 m tall, glabrous; branches cylindrical, lateral branching ± parallel. Stipule usually persistent, foliaceous, sheath connate, limb obtuse to truncate, enveloping the branches, colleters scattered internally throughout the lamina, with a reduced arista ca. 1 mm or absent, not decurrent; petiole 1–2 cm; lamina 14–18(25) × 5–7(10) cm, coriaceous, elliptic, apex 7–8 cm, acuminate, base cuneate, margin revolute, secondary and tertiary venation visible abaxially and adaxially, young leaves blue-toned. Inflorescence terminal, thyrsoid, peduncle 3–5 cm, cylindrical, profusely branched, white to lilac; pedicel 1–4 mm; foliaceous bracts ca. 7–10 × 4–6 cm, obovate to elliptic, flat, bracteoles inconspicuous. Flowers presumably heterostylous, scented, anthesis diurnal; calyx tube ca. 1 mm, apex shortly toothed, colleters inserted internally, halfway up the calyx tube; pin flowers with white corolla tube, margin of corolla lobes blue; corolla hippocrateriform, 6–7 mm, lobes 2–3 mm, slightly reflexed, carinose; stamens inserted halfway up the tube, filaments 4–5 mm, anthers 2.5–3.5 mm; style 4–5 mm, stigmas 0.5–1 mm, internally papillose, nectar disk cylindrical; thrum flowers not observed. Fruit 10–12 × 8–10 mm, oblate, pedicel 1–3 mm, with shortly toothed calyx tube or displaying only the scar and the nectar disk, pericarp green turning black when ripe, smooth; pyrene 10–12 × 7–8 mm, oblate,

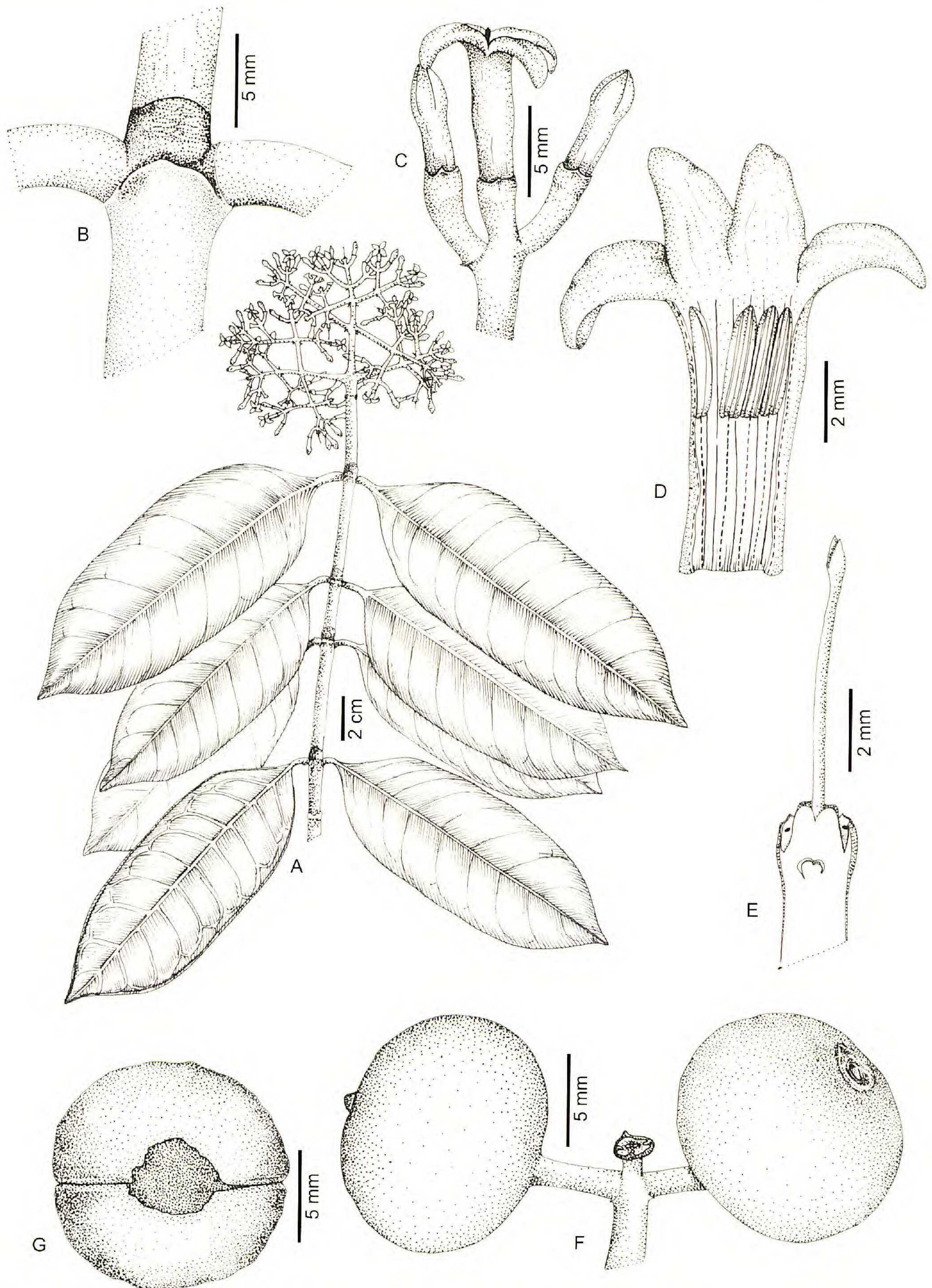


Figure 2. *Faramaea bicolor* J. G. Jardim & Zappi. —A. Habit. —B. Stipule. —C. Detail of inflorescence. —D. Open corolla, showing stamens. —E. Longitudinal section of calyx showing nectar disk and style. —F. Fruits. —G. Pyrene, ventral view. A–E, drawn from the holotype Jardim *et al.* 4169; F, drawn from Mori 11764; G, drawn from Fiaschi *et al.* 2390.

slightly wrinkled, longitudinally sulcate, pre-germination orifice ca. 3×5 mm, almost rounded; seed ca. 7×6 mm, oblate, testa smooth, longitudinally sulcate.

Distribution and habitat. *Faramaea bicolor* is found in southeastern Bahia, in Brazilian Atlantic rainforest, between 400 and 800 m, as understory shrubs to small trees.

IUCN Red List category. By IUCN (2001) criteria, *Faramea bicolor* is Vulnerable (VU), B2a, b(i, ii, iii); extension of occurrence estimated ca. 8766 km². This species is only known from three conservation areas in Bahia, from the Estação Ecológica Estadual de Wenceslau Guimarães, Parque Estadual Serra do Conduru, and the Reserva Particular do Patrimônio Natural Jequitibá/Sapucaia (Fazenda Água Boa), in Maraú.

Phenology. Flowering plants were observed between December and February; fruiting plants were observed from February to August.

Etymology. The specific epithet of this new species refers to the graceful, bicolored flowers, with contrasting blue and white lobes.

Vernacular name. Unknown.

Relationships. *Faramea bicolor* differs from other known species of *Faramea* by its reduced or absent stipular arista; the peculiar limb enveloping the branches; leaves with coriaceous texture, strongly revolute margin, and very prominent secondary venation; and bicolored, contrasting blue and white flowers.

Despite the fact that the morphology of the stipules resembles the closely related genus *Coussarea* Aublet, the characters that place *Faramea bicolor* within *Faramea* are the blue coloration in its young leaves, corolla, and fruits (this color is totally absent from species of *Coussarea*), as well as seeds with an excavated base and lateral embryo, while in *Coussarea* the seed base is not excavated and the embryo is basal. The new species resembles *F. martiana* Müller Argoviensis because of its terminal, many-flowered inflorescence and elliptic leaves, but can be easily distinguished by its petiolate leaves with revolute margins (vs. leaves generally sessile, margin flat), the connate stipular limb enveloping the branches, with the arista reduced or absent (vs. the stipular limb connate only at base and not enveloping the branches, with the arista 3–7 mm long), and the striking bicolored corolla (vs. the corolla entirely violet).

Paratypes. BRAZIL. **Bahia:** Maraú, Faz. Água Boa, BR 030 a 22 km E de Ubaitaba, S. A. Mori 12744 (CEPEC, MO, NY not seen); Una, Ribeirão da Caveira, Serra do Javi, ramal com entrada no Km 11 da Rod. São José–Una, ca. 6 km S da entrada, T. S. Santos & E. Judziewicz 3994 (CEPEC, NY not

seen); Uruçuca, est. Serra Grande–Uruçuca, Serra do Conduru, Mata da Torre de Celular, P. Fiaschi, A. M. Amorim, J. G. Jardim, J. L. Paixão & S. C. Sant'Ana 2390 (CEPEC, SPF not seen); nova estrada que liga Uruçuca a Serra Grande, S. A. Mori 11748 (CEPEC, NY not seen), S. A. Mori 11764 (CEPEC, UB, MO, NY not seen); Wenceslau Guimarães, Forest of Faz. Boa Esperança near Res. Estadual Wenceslau Guimarães, 8 km above Rio Vermelho, 2 km above jct. with rd. to Taquara, W. W. Thomas, A. M. de Carvalho, A. M. Amorim, T. S. Santos, S. C. Sant'Ana & J. G. Jardim 9383 (CEPEC, MO, NY not seen); Est. Ecol. Est. Nova Esperança, A. M. Amorim, J. G. Jardim, C. van den Berg, J. L. Paixão, S. C. Sant'Ana, & A. B. Rodrigues 5092 (CEPEC).

Acknowledgments. The first author is grateful to Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) for supporting his research. Both authors wish to acknowledge the curators and staff of the herbaria CEPEC, HUEFS, and K for access to their collections and facilities; Maria Verônica Pereira-Moura, Victoria C. Hollowell, Beth Parada, and Allison Brock for very helpful reviews of this manuscript; Carla de Lima (HUEFS) for inking the drawings; and Charlotte Couch, Steve Bachman, and Justin Moat for assistance with the conservation assessments.

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